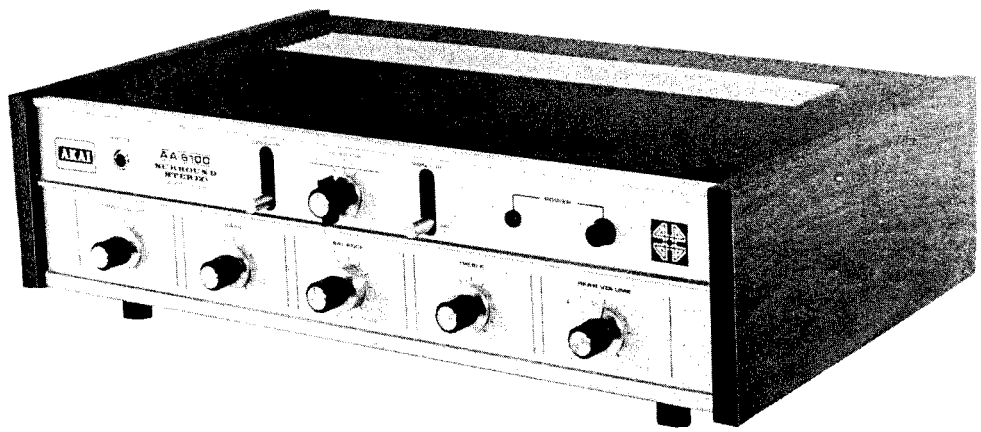
SERVICE MANUAL

AKAI AMPLIFIER

MODEL AA-6100



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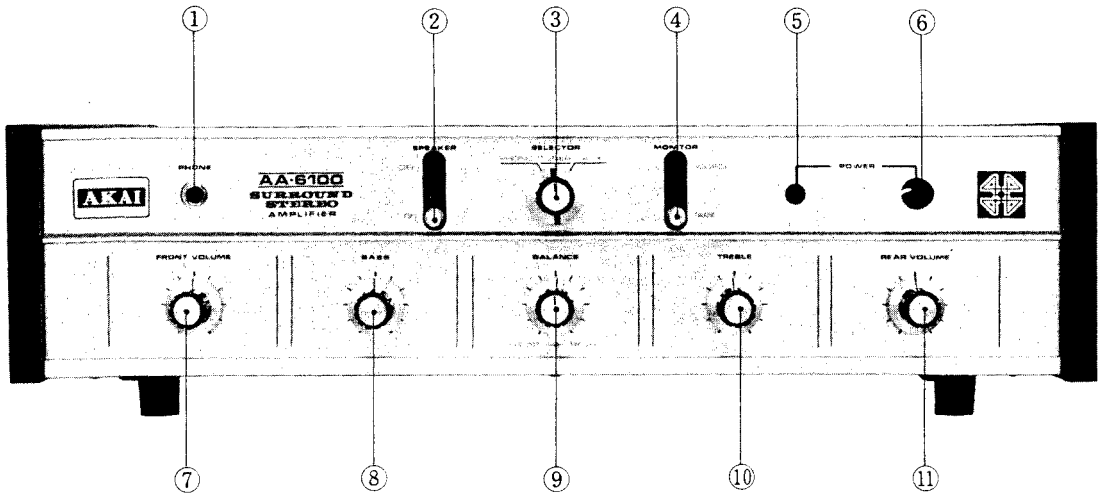
When placing order for parts, please use separate PARTS LIST or PRICE LIST FOR PARTS.

I. SPECIFICATIONS

SYSTEM	:	Solid State 4-channel stereo pre-main amplifier
MUSIC POWER	:	80 W (20 W x 4), 8 Ω
CONTINUOUS POWER	:	50 W (12.5 W x 4), 8 Ω
HARMONIC DISTORTION	:	1.2% (10 W/8 Ω, 1 kHz)
INPUT/SENSITIVITY	:	Tape Monitor (P.B.) 500 mV, 300 kΩ Tape Monitor (DIN) 150 mV, 100 kΩ Tuner ..... 150 mV, 100 kΩ Aux ..... 150 mV, 100 kΩ Phono ..... 3 mV, 50 kΩ
FREQUENCY RESPONSE	:	AUX: 20 Hz to 22,000 Hz (−3 dB) PHONO: RIAA
S/N RATIO	:	Better than 70 dB
RESIDUAL NOISE	:	Less than 5 mV
TONE CONTROLS	:	Bass ..... ±12 dB, 100 Hz Treble ..... ±12 dB, 10 kHz
INPUT TERMINALS	:	4 Tape monitor (P.B.), 4 Tuner, 4 Aux, 2-Phono
OUTPUT TERMINALS	:	4 Speaker Out, 4 REC Out, 1 Headphone Out
DIN JACK	:	2
SEMI-CONDUCTORS	:	29 Silicon transistors 8 Diodes 8 Thermisters
POWER CONSUMPTION	:	120 W
POWER SOURCE	:	AC 100 to 240 V, 50/60 Hz
DIMENSIONS	:	420(W) x 100(H) x 240(D) mm (16.8" x 4" x 9.6")
WEIGHT	:	8.6 kg (19 lbs.)

II. CONTROLS AND CONNECTIONS



① STEREO HEADPHONE JACK: Accomodates stereo headphones for monitoring or private listening (set Speaker Switch to "Off" position).
Dynamic type stereo headphones (about 8 Ω impedance) should be used. AKAI Model ASE-20 is highly recommended.

② SPEAKER SWITCH: ON/OFF Speaker Switch (Set to position for stereo headphone listening).

③ SELECTOR SWITCH: Set Tape Monitor Switch to SOURCE position and select program source.
PHONO: For record player
TUNER: For AM or FM Tuner
AUX: For Tape Recorders or other sources connected to AUX terminals at rear of amplifier (high output players, ceramic or crystal pick-up, etc.)

④ MONITOR SWITCH: For sound during recording or playback with a 3-head tape recorder, set to TAPE position.
For sound from others sources (record player, FM, AM, etc.), set to SOURCE position.

⑤ POWER INDICATOR LAMP: For quick and easy confirmation of power supply.

⑥ POWER SWITCH: Depress to turn on power.

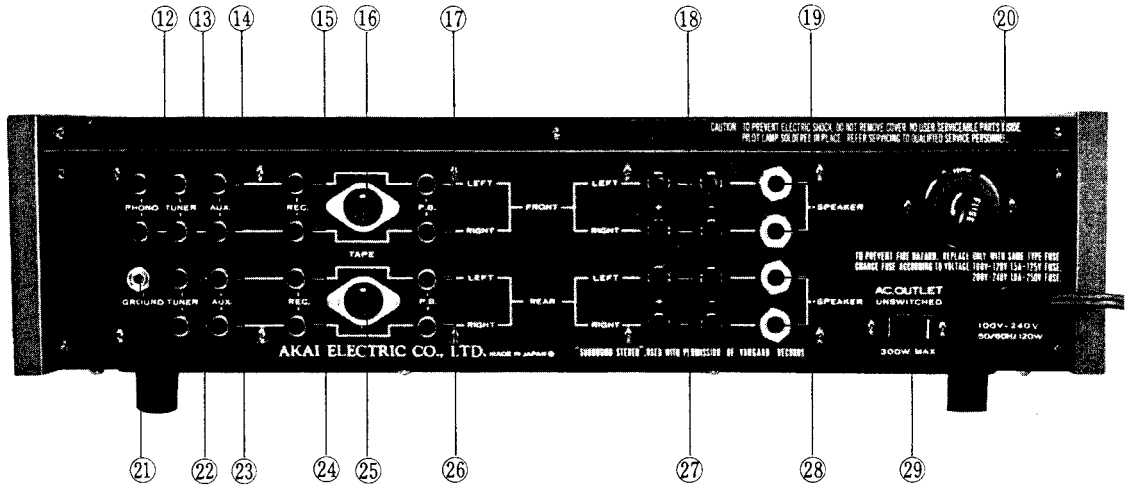
⑦ FRONT VOLUME CONTROL: Controls both left and right front channels.
Clockwise increases volume.

⑧ BASS CONTROL: Controls low range frequency response of all 4 channels simultaneously.
Clockwise increases bass response.

⑨ BALANCE CONTROL: For balancing volume of left and right speakers. Turning knob clockwise will increase the volume of the 2 right speakers by reducing the output of the 2 left speakers (front & rear channel). Turning the knob counter-clockwise will reverse the procedure.

⑩ TREBLE CONTROL: Controls high range frequency response of all 4 channels simultaneously.
Clockwise increases treble response.

⑪ REAR VOLUME CONTROL: Controls both left & right channels.
Clockwise increases volume.



⑫ PHONO JACKS (Front Channel): Use for 2-channel magnetic cartridge (MM, MC, IM, etc.)

⑬ TUNER JACKS (Front Channel): For connection of external tuner.

⑭ AUX TERMINALS (Front Channel): Use for relatively high voltage input such as output from amplifier of a tape recorder or a record player with a ceramic or or crystal cartridge, etc.

⑮ TAPE REC. JACKS (Front Channel): Connects to line input terminals of tape recorder. Recording source is selected by operating the Selector Switch.

⑯ DIN JACK (Front Channel): This one-connection system can be used instead of Tape Rec Jacks and Tape P.B. Jacks if the tape recorder has a corresponding connection. If your tape recorder is not equipped with a DIN Jack, AKAI Connection Cord DR-110 can be used.

⑰ P.B. JACKS (Front Channel): Connects to the front channel line or pre-amp output of a tape deck and permits monitoring of the tape playback through use of the Tape Monitor Switch.

⑱ SPEAKER OUTPUT TERMINALS (Front Channel): Supplies output to front channel speaker system. Connect plus and minus terminals to correspond with polarity of speakers.

⑲ SPEAKER OUTPUT JACKS (Front Channel): For connection of a single + – type plug for front channel speaker system.

⑳ VOLTAGE SELECTOR AND FUSE: Universal Voltage Selector permits selection of voltage from 100 to 240 V AC. Fuse must be changed to correspond with voltage.

100 to 120 V	1.5 A 125 V FUSE
200 to 240 V	1 A 250 V FUSE

㉑ PHONO GROUND TERMINAL: Used to ground arm of record player. If this connection causes excessive noise, do not use.

㉒ TUNER JACKS (Rear Channel): For use together with front channel Tuner Jacks for receiving 4-channel radio broadcasts.

㉓ AUX TERMINALS (Rear Channel): For use together with front channel AUX terminals for 4-channel high voltage input operation.

㉔ TAPE REC. JACKS (Rear Channel): For use together with front channel Tape Rec. Jacks for 4-channel input terminals of tape recorder or tape deck. Recording source is selected by operating the Selector Switch.

㉕ DIN JACK (Rear Channel): This one-connection system can be used instead of rear channel Tape Rec. Jacks and Tape PB Jack if the tape recorder has a corresponding connection. If your tape recorder is not equipped with a DIN Jack, AKAI Connection Cord DR-110 can be used.

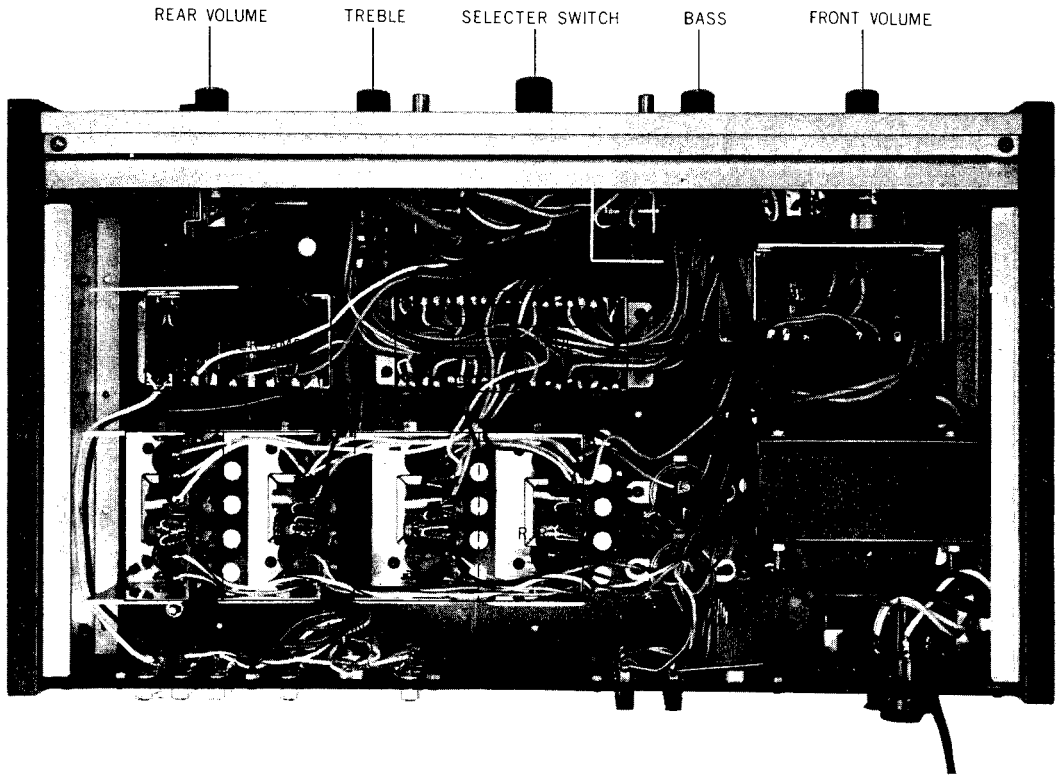
㉖ P.B. JACKS (Rear Channel): For use together with front channel P.B. Jacks. Connects to rear channel line or pre-amp output of tape deck and permits monitoring of 4-channel tape playback through use of the Tape Monitor Switch.

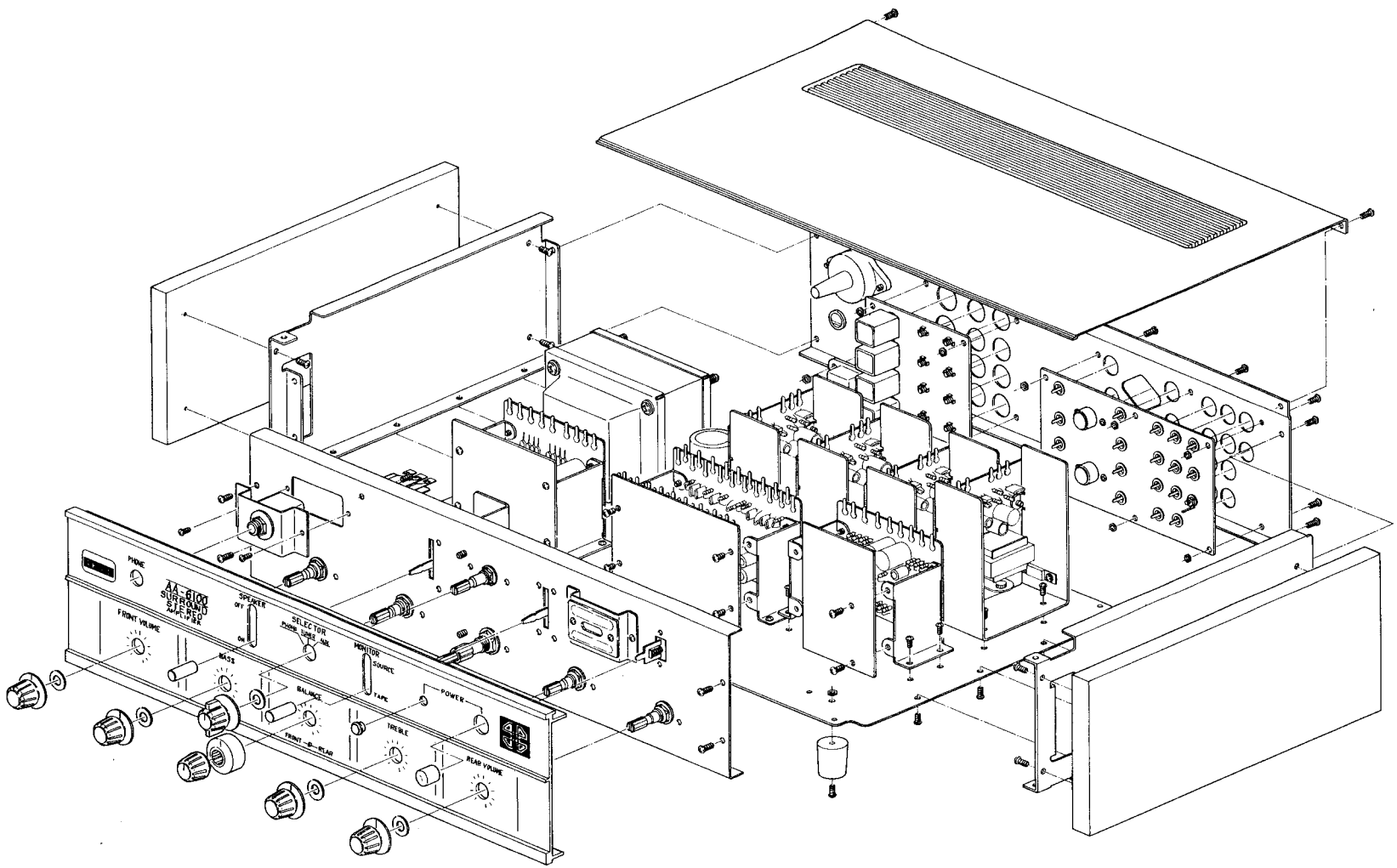
㉗ SPEAKER OUTPUT TERMINALS (Rear Channel): Supplies output to rear channel speaker system. Connect plus and minus terminals to correspond with polarity of speakers.

㉘ SPEAKER OUTPUT JACKS (Rear Channel): For connection of a single + – type plug for rear channel speaker system.

㉙ AC OUTLET: Extra power supply for record players or tape recorders. This 300 W unswitched outlet is not interlocked with the front panel power switch (power is applied even with the unit turned off).

III. ORDER OF AMPLIFIER




PHONE
AA-6100
SURROUND
STEREO
AMPLIFIER
SPEAKER
OFF
ON
SELECTOR
PHONE TUNER AUX
MONITOR
SOURCE
TAPE
FRONT VOLUME
BASS
BALANCE
TREBLE
POWER
REAR VOLUME
FRONT-B-REAR

IV. POWER AMPLIFIER CIRCUIT ADJUSTMENT

When repairing the power amplifier circuit, if the power transistor has been changed, make the following adjustments. (Make various adjustments of each channel).

1. Electric current adjustment (with power amp at non-signal condition).

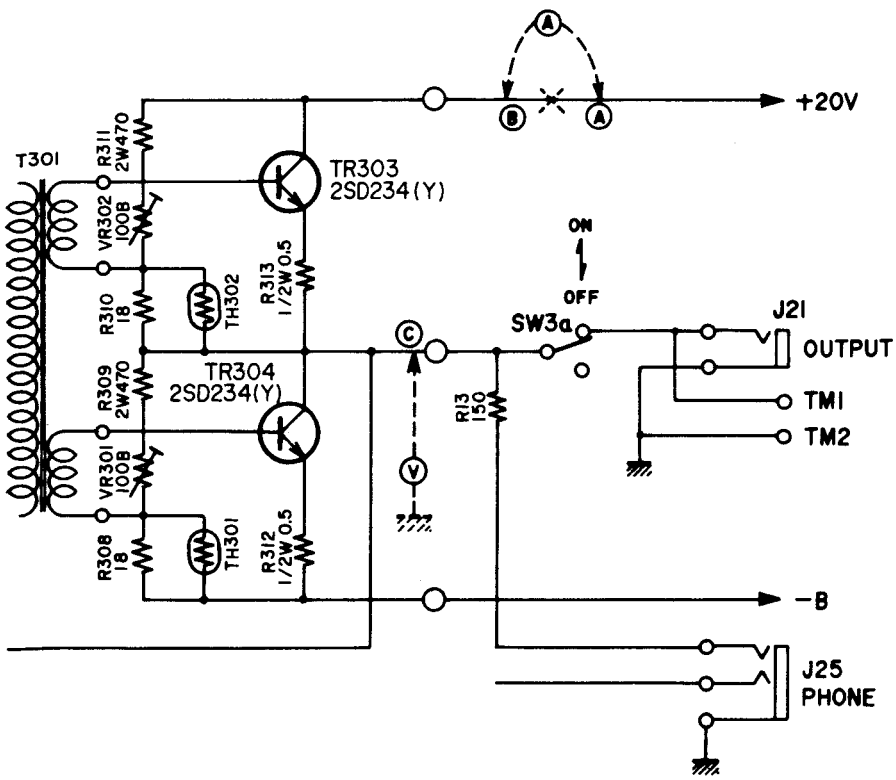
   A. Connect a DC Ammeter between points A and B (Fig. 1). (Convenient if ammeter is capable of measuring full scale range down to about 0.1 A).

   B. Connect a DC Voltmeter to Point C (Fig. 1). (Use a voltmeter with milli-volt scale).

   C. Turn Volume Control Knob on front panel (VR 1a, 1b, or VR 2a, ab) fully counter-clockwise (to minimum position).

   D. Turn on Power Switch. At this time, alternately adjust VR-301 and VR-302 so that the Ammeter indicates 50 to 60 mA and the Voltmeter indicates 0 V.

   E. Adjust all channels equally.



V. TROUBLE SHOOTING CHART

NO SOUND

Symptom	Trouble
Defective speaker system	1. Speaker cables open or shorted. 2. Speaker voice coil open.
No electrical supply	1. Absence of power supply. 2. Defective power switch. 3. AC power cord plug has faulty contact or is disconnected. 4. Power fuse blown.
Blown power fuse upon replacement.	1. Short in power transformer. 2. Shorted Diodes (D401 – D408) 3. Defective Transistor (TR401) 4. Shorted electrolytic capacitors (C1, C2, C401, C403)
No sound from speaker when using PHONO (Tuner, Aux, Tape O.K.)	1. Check Transistor TR101, 102. 2. Check selector switch SW1a – SW1c
No sound from speaker (when using PHONO, TUNER, AUX or TAPE)	1. Check Transistor TR201, 202 and 301, 304 2. Check selector switch SW1a to SW1c. 3. Check monitor switch (SW2a to SW2c) 4. Check speaker ON–OFF switch.
Inoperative "B" power source circuit	1. Secondary winding in power transformer open. 2. Check Diode D401 to 408 3. Check Transistor TR401
No sound from one channel (Front or rear)	1. Improper position of balance control. 2. Defective channel audio circuit.

LOW SOUND LEVEL, DISTORTION, HUM, AND NOISE

Symptom	Trouble
Low sound (all channels)	1. Defective power supply circuit (check wiring and voltage).
Low sound (one channel)	1. Defective speaker. 2. Discharged coupling capacitor. (Replace defective capacitor).
Distorted sound (all channels)	1. Defective power supply circuit. (check power supply circuit).
Distorted sound (one channel)	1. Defective speaker. 2. Leaky coupling capacitor. 3. Defective or unbalanced power transistor.
Excessive hum	1. Discharged capacitor in power supply circuit (check C1, C2, and C401 to C403). 2. Defective rectifying diodes in power supply circuit (D401 to D408). 3. Check Transistor TR401.
Excessive noise	1. Check Transistor TR101,,2, 201, 2, 301 to 4. 2. Check volume control variable resistor. (VR V1a, b, 2a, b).

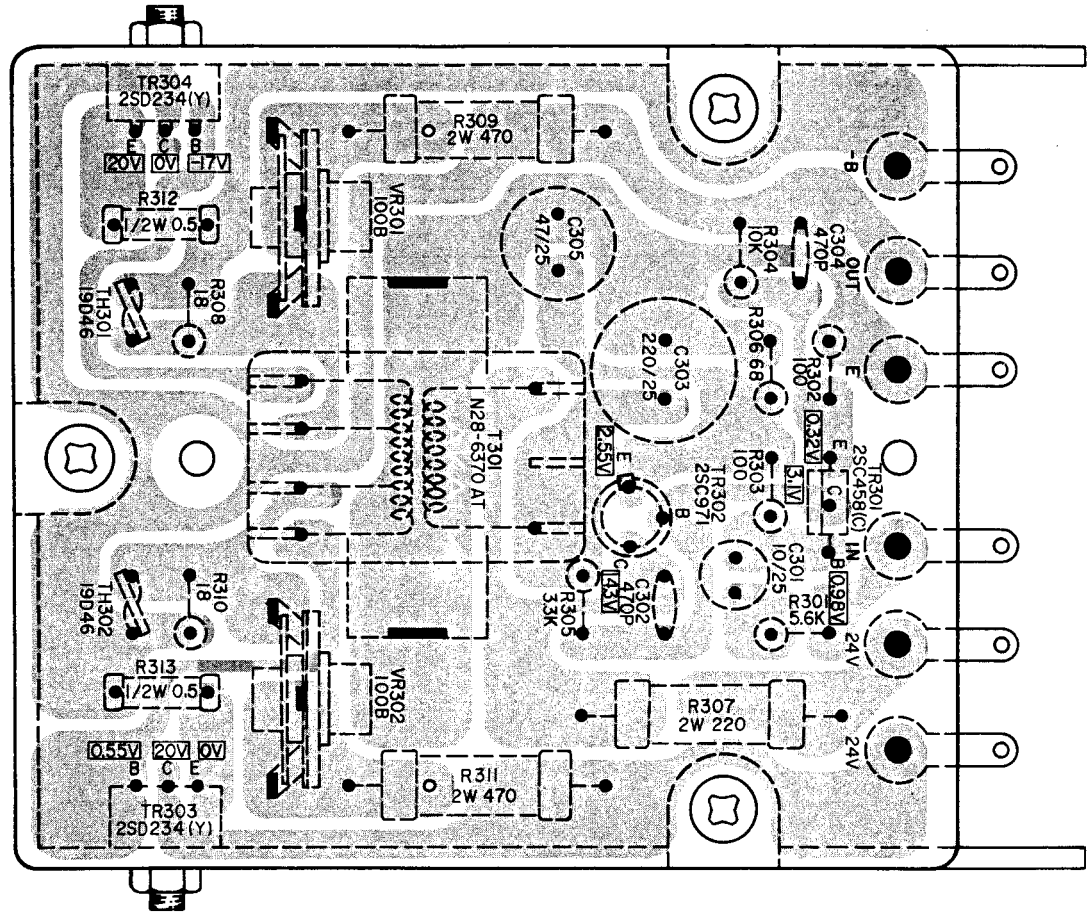
Symptom	Trouble
Tone control inoperative (At "Treble") (At "BASS")	1. Check C205 2. Check volume control (VR3a, 3b, 100KB) 1. Check C203, C204 2. Check volume control (VR4a, 4b, 100KB)

WHEN EXTERNAL INPUT IS USED (Tape recorder, etc.)

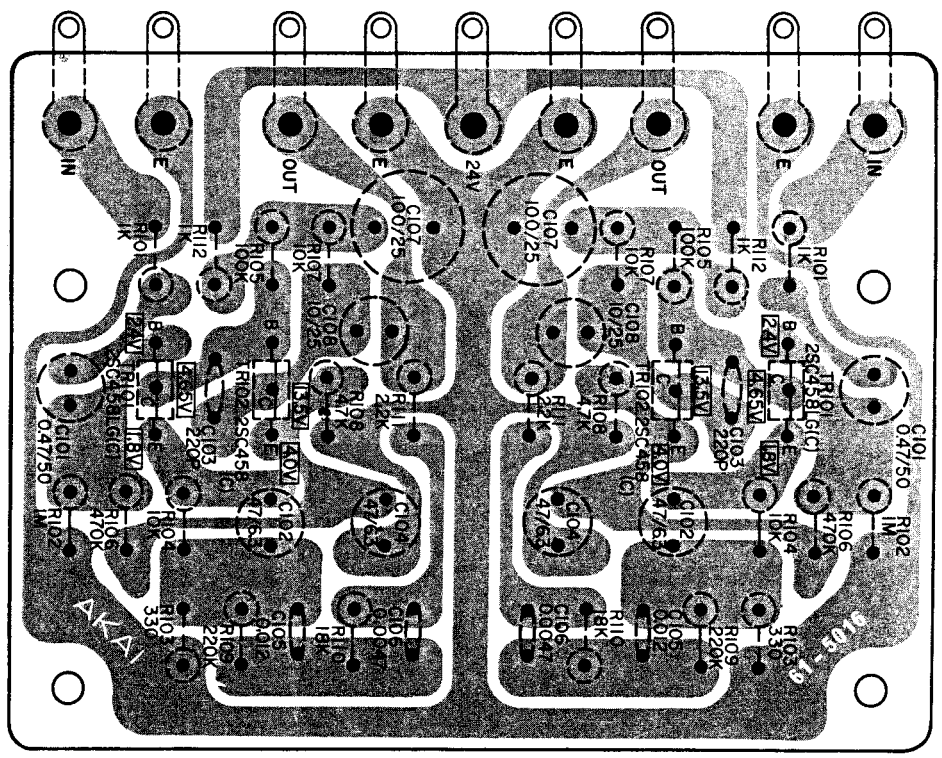
Symptom	Trouble
No sound or Increase of noise or Hum	1. Faulty connection. (check connections and polarity referring to operator's manual.) 2. Check selector switch. (SW1a to d) 3. Check monitor switch (SW2a to d)

VI. COMPOSITE VIEWS OF COMPONENT

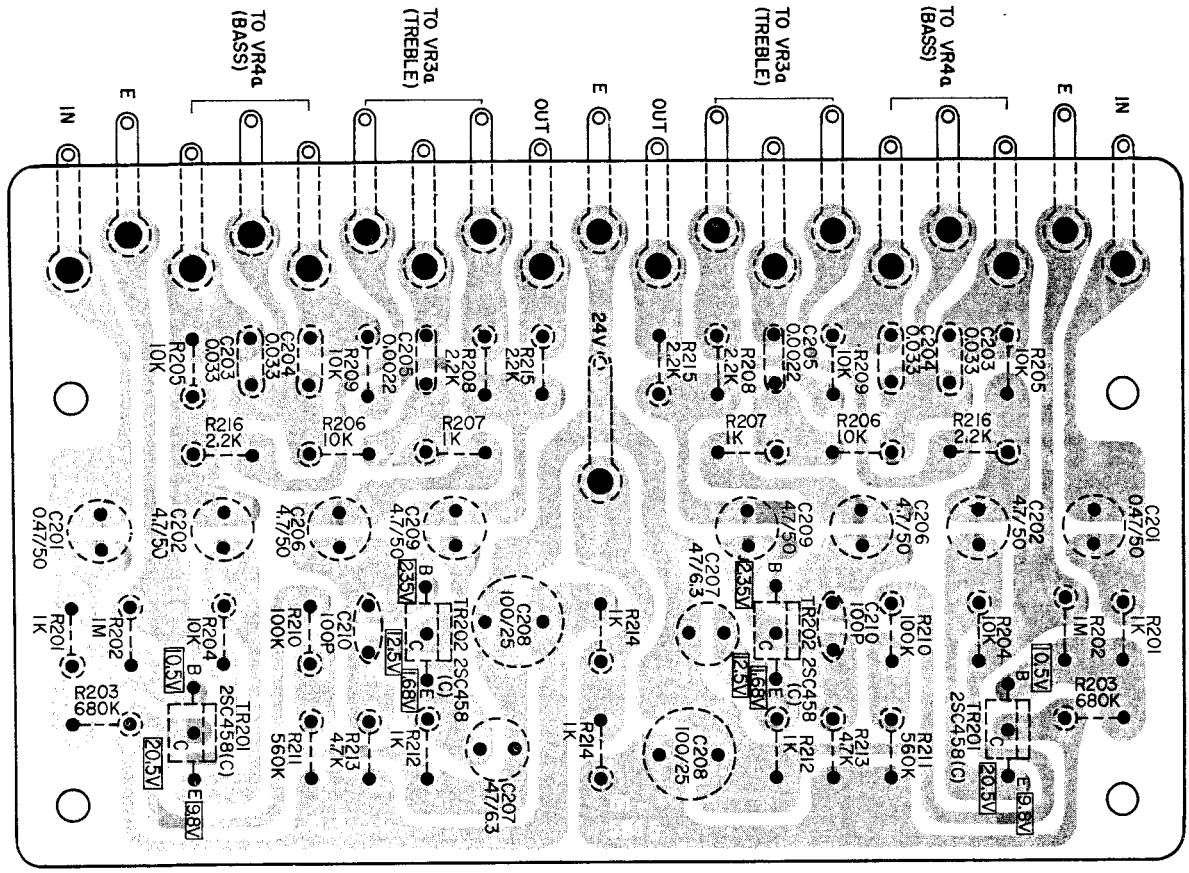
MAIN AMP. P.C. BOARD (61–5014)



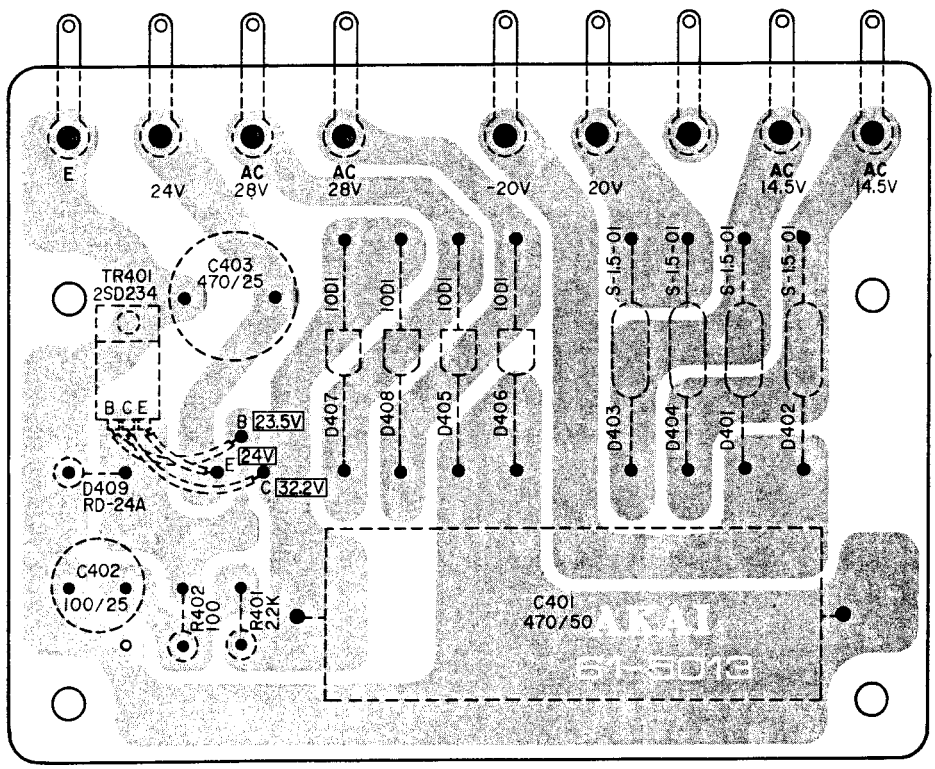
EQUALIZER AMP. PC. BOARD (61–5016)



TONE CONTROL AMP. P.C. BOARD (61–5015)



POWER SUPPLY P.C. BOARD (61–5013)



AA-6100 SCHEMATIC DIAGRAM 14204061

TR101 2SC458LG © TR102 2SC458LG © TR 201 2SC 458 © TR 202 2SC 458LG © TR 301 2SC 458 © TR302 2SC 971 TR303 2SD 234 Ⓨ

FRONT

PHONO J1 · TUNER J2 · AUX. J3 · REC. J4 · TAPE P.B J5

SELECTOR SW1a · MONITOR SW 2a · FRONT VOLUME VR 1a 250KA

LEFT

(61 - 5016)

RIGHT

PHONO J7 · TUNER J8 · AUX J9 · REC. J10 · TAPE P.B J11

SW 1b · SW 2b · VR 1b 250KA

EQ AMP.

TREBLE VR3a 100KB · BASS VR4a 100 KB

TREBLE VR 3b 100KB · BASS VR 4b 100KB

LEFT / RIGHT TONE CONTROL AMP. (61-5015)

BALANCE VR 5a 50 KB

T 301 N28-6370AT

MAIN AMP

TR 304 2SD 234 Ⓨ

SPEAKER ON / OFF · SW 3a

J 21 OUT PUT · TM 1 · TM 2

J 25 PHONE

RIGHT MAIN AMP. (61-5014)

J 22 OUT PUT · TM 3 · TM 4 · SW 3b

-B

+24V

+20V

REAR

TUNER J 12 · AUX. J 13 · REC. J 14 · TAPE P.B J 15

SW 1c · SW 2c · REAR VOLUME VR2a 250KA

TREBLE VR3C 100KB

VR 4C 100 KB · BASS

LEFT MAIN AMP.

TONE CONTROL AMP.

RIGHT MAIN AMP.

BALANCE VR 5b 50KB

TUNER J 17 · AUX. J 18 · REC. J 19 · TAPE P.B J 20

SW 1d · SW 2d · VR2b 250KV

TREBLE VR 3d 100KB

VR 4d 100KB · BASS

SW3c · J 23 OUT PUT · TM 5 · TM 6

SW3d · J 24 OUT PUT · TTM 7 · TM 8

T 1 AAT-6 · PL1

VOLTAGE SELECTOR SW 5 · 240V · 220V · 200V · 120V · 110V · 100V

F 1 1.5A · J 26 · CR 1 0.033+120/400 · SW 4 POWER

D401 D402 D403 D404 S-1.5-01x4 · C 1 2200/25 · C 2 2200/25

TR 401 2SD234 Ⓞ · D405 D406 D407 D408 10D1 X 4 · C401 470/50 · R401 2.2K · R402 100 23.5V · C403 470/25 · C402 100/25 · D409 RD-24A

(61-5013) POWER SUPPLY

NOTE

UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W K
ALL CAPACITORS IN MFD (K) 50WV, MFD/WV,
P= M·MFD